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IS : 967 - 1956

Indian Standard

METHOD FOR DETERMINATION OF COLOUR FASTNESS OF TEXTILE MATERIALS TO ACID CHLORINATION

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INDIAN STANDARDS INSTITUTION
19 UNIVERSITY ROAD, CIVIL LINES
DELHI 8

February 1957

Indian Standard

METHOD FOR DETERMINATION OF COLOUR FASTNESS OF TEXTILE MATERIALS TO ACID CHLORINATION

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 22 November 1956, on approval by the Textile Division Council of the draft finalized on 8 August 1956 by the Textile Chemistry Sectional Committee.

0.2 Colour fastness of textile materials is of considerable importance to the consumer. The fastness depends not only upon the nature and depth of shade of the dyestuff used but also upon the nature of the fibre and the method of dyeing or printing employed; the same colouring matter, when used in dyeing or printing different fibres or when applied by different methods upon the same fibre, may give vastly different results. Formulation of standard methods of test for determining colour fastness of textile materials to different agencies and processes likely to effect change in colour is, therefore, necessary.

0.3 The method of test prescribed in this standard is intended for evaluating colour fastness of textile materials to the manufacturing operation in which an acid hypochlorite solution is used to prevent woollen textile materials from shrinking.

0.3.1 Since it is equally important to evaluate colour fastness of textile materials to the action of other agencies and processes which affect colour, such as, washing, dry cleaning, hot pressing, rubbing, sea water, etc, separate Indian Standards dealing with methods of test for evaluating colour fastness in respect of these agencies and processes are being issued. A complete list of such standards may be obtained from the Indian Standards Institution.

0.4 Taking into consideration the views of the producers, the consumers and the testing authorities, the Sectional Committee responsible for the preparation of this standard felt that it should be related to the manufacturing and testing practices followed in the country in this field. Furthermore, due weightage had to be given to the need for international co-ordination between standards prevailing in different countries of the world. These considerations led the Sectional Committee to base this standard mainly on the method of test for colour fastness to acid chlorination recommended by the ISO Subcommittee for Colour Fastness Tests (ISO/TC 38/SC 1) in its third meeting at Scarborough.

0.5 This standard method requires reference to the following Indian Standards:

IS: 768-1956 METHOD FOR EVALUATING CHANGE IN COLOUR

IS: 769-1956 METHOD FOR EVALUATING STAINING

0.5.1 Wherever a reference to any Indian Standard mentioned in **0.5** appears in this standard method, it shall be taken as a reference to the latest version of the standard.

0.6 In view of the decision of the Government of India to introduce in the country a uniform system of weights and measures based on the metric system, all measurements in this standard have been given in metric units.

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1. SCOPE

1.1 This standard prescribes a method for determination of colour fastness of textile materials to the action of acid hypochlorite solution.

1.2 The method is mainly applicable to materials containing wool.

2. SAMPLING

2.1 Sample to determine conformity of a lot of coloured textile material to a specification shall be selected so as to be representative of the lot.

2.2 Sample drawn in compliance with an agreement between the buyer and the seller to evaluate colour fastness of the material in the lot shall be held to be representative of the lot.

3. COMPOSITE SPECIMEN

3.1 Undyed Material — Take sufficient lengths of yarns of scoured unbleached undyed wool, undyed bleached cotton and other fibres as desired for testing yarns and fabrics; take sufficiently large sized comparable pieces of undyed cloth for use in testing loose fibre.

3.2 Test Piece

3.2.1 *If the material to be tested is fabric,* draw a 7·5 × 5 cm test piece from the sample.

3.2.2 *If the material to be tested is yarn,* knit or weave some of the sample into fabric and draw from it a 7·5 × 5 cm test piece.

3.2.3 *If the material to be tested is loose fibre,* comb and compress enough of the sample into the form of a sheet to make a 7·5 × 5 cm test piece.

3.3 Preparation of Composite Specimen

3.3.1 *If the test piece is in the form of fabric* (*see* **3.2.1** *and* **3.2.2**), sew stitches of the undyed yarns (*see* **3.1**) at intervals of approximately 1 cm into the test piece to form a composite specimen.

3.3.2 *If the test piece is in the form of a sheet of fibre,* place it between the two pieces of undyed cloth (*see* **3.1**) and sew the three together with stitching at intervals of 1 cm to form a composite specimen. The weight of the test piece should approximate to that of the undyed woollen piece.

4. COMPOSITE TEST CONTROL

4.1 Test Control — A dyeing of 1·5 percent Solway Blue GS on woollen cloth, shall be used as a test control to ensure that the test is carried out correctly.

NOTE 1 — For preparation of the dyeing *see* Appendix A.

4.2 Preparation of Composite Test Control

4.2.1 Prepare a composite test control in the way outlined for fabric (*see* **3.3.1**).

5. QUALITY OF REAGENTS

5.1 Pure chemicals and distilled water shall be used for the purpose of this test.

NOTE 2 — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

NOTE 3 — In the case of a dispute, chemicals of analytical reagent grade shall be used for the test.

6. APPARATUS

6.0 The following apparatus shall be used.

6.1 Container — made of glass or glazed porcelain with provision for closing.

7. REAGENTS

7.0 The following reagents shall be used.

7.1 Hydrochloric Acid Solution — containing 6 ml of hydrochloric acid (sp-gr 1·16) per litre.

7.2 Sodium Hypochlorite Solution — containing 1 g of available chlorine per litre. Sodium hypochlorite shall be of the following composition:

	Percent
Sodium hypochlorite, NaOCl	14 to 16
Sodium chloride, NaCl	12 to 17
Sodium hydroxide, NaOH (*max*)	2·0
Sodium carbonate, Na_2CO_3(*max*)	2·0
Iron, Fe (*max*)	0·001

7.3 Sodium Sulphite Solution — containing 3 g of sodium sulphite ($Na_2SO_3.7H_2O$) per litre.

8. PROCEDURE

8.1 Immerse the composite specimen (*see also* **8.1.1**) in the hydrochloric acid solution for 10 minutes at room temperature, liquor to material ratio being 25: 1 (ml: g). Add an equal volume of sodium hypochlorite solution, close the container and keep the specimen immersed for a further period of 10 minutes. Remove the composite specimen, rinse it thoroughly in cold running tap water and then immerse it in the sodium sulphite solution for 10 minutes at 35° to 40°C at a liquor to material ratio of 25 : 1 (ml: g). Remove the specimen, rinse it thoroughly in cold running water and dry it in air in shade at a temperature not exceeding 60°C.

8.1.1 Treat the composite test control in the manner prescribed in **8.1** in parallel but in a separate bath.

8.2 Evaluate the change in colour of the treated test control by the method prescribed in IS: 768-1956. If the numerical rating for change in colour is not equal to 3, repeat the whole test (*see* **8.1** *and* **8.1.1**) using a fresh composite specimen and fresh composite test control.

NOTE 4 — Treated test control and the undyed material should have cooled after drying and should have regained their normal moisture content before evaluation.

8.3 Evaluate the change in colour of the treated test piece by the method prescribed in IS: 768-1956 and the degree of staining of each type of undyed material by the method prescribed in IS: 769-1956

NOTE 5 — Treated test piece and the undyed material should have cooled after drying and regained their normal moisture content before evaluation.

9. REPORT

9.1 Report (i) the numerical rating for change in colour of the test piece, and (ii) the numerical rating for staining of each kind of undyed material used in the preparation of the composite specimen.

APPENDIX A

(*Clause* 4.1)

PREPARATION OF DYEING

A-1. Wet out a sufficiently large sized piece of woollen cloth and enter it at 40°C into a dyebath containing 1·5 percent Solway Blue GS, 10 percent sodium sulphate crystals (Na_2SO_4, $10H_2O$), and 3 percent sulphuric acid (sp-gr 1·84), all percentages being calculated on the weight of the piece, at a liquor to piece ratio of 40: 1 (ml: g).

A-2. Raise the dyebath to the boil in 15 minutes and boil for a further 45 minutes. Remove the piece, rinse it in cold running tap water and dry.

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TO

IS : 967-1956 METHOD FOR DETERMINATION OF COLOUR FASTNESS OF TEXTILE MATERIALS TO ACID CHLORINATION

Alterations

(*Clause* **4.1**, *line* 1) — Substitute ‘1 percent’ *for* ‘1·5 percent .

(*Clause* **8.1**, *line* 11) — Substitute ‘50 : 1’ *for* ‘25 : 1’.

(*Page* 4 *clause* **A-1**, *line* 3) — Substitute ‘1 percent Solway Blue GS (Colour Index, Second Edition, Acid Blue 37)’ *for* ‘1·5 percent Solway Blue GS’.

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(*Clause* **3.1**, *line* 5) — Substitute ' adjacent fabric ' *for* ' undyed cloth '.

(*Clause* **3.2.1**, *line* 2) — Substitute ' 10 cm × 4 cm ' *for* ' 7·5 × 5 cm '.

(*Clause* **3.2.2**, *line* 3) — Substitute ' 10 cm × 4 cm ' *for* ' 7·5 × 5 cm '.

(*Clause* **3.2.3**, *line* 3) — Substitute ' 10 cm × 4 cm ' *for* ' 7·5 × 5 cm '.

(*Clause* **3.3.2**, *lines* 2 *and* 3) — Substitute ' adjacent fabric ' *for* ' undyed cloth '.

(*Clause* **3.3.2**, *line* 6) — Substitute ' wool adjacent fabric ' *for* ' undyed woollen piece '.

(*Clause* **8.2**, *line* 2) — Substitute ' IS : 769-1982 Method for evaluating change in colour (*first revision*) ' *for* ' IS : 768-1956 '.

(*Clause* **8.3**) — Insert ' NOTE 6 ' after ' NOTE 5 ' as follows:

> ' NOTE 6 — In cases of doubt in the colour fastness ratings as assessed by an observer, the assessment should be done by at least three observers and the overall average rating should be reported.'

(*Clause* **9.1**, *line* 3) — Insert the word ' adjacent ' between the words ' undyed ' and ' material '.

(TDC 5)

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